DOCUMENT RESUME

ED 062 444 TM 001 612

TITLE	Order Filler (any ind.) 922.887 (9-88.40)--Technical Report on Development of USES Aptitude Test Battery.
INSTITUTION	Manpower Administration (DOL), Washington, D.C. U.S. Training and Employment Service.
REPORT NO	TR-S-182
PUB DATE	Mar 66
NOTE	13p.
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	*Aptitude Tests; *Cutting Scores; Evaluation Criteria; Job Applicants; *Job Skills; Merchandising; Norms; Occupational Guidance; *Personnel Evaluation; *Retailing; Test Reliability; Test Validity
IDENTIFIERS	GATB; *General Aptitude Test Battery; Order Filler

ABSTRACT

The United States Training and Employment Service General Aptitude Test Battery (GATB), first published in 1947, has been included in a continuing program of research to validate the tests against success in many different occupations. The GATB consists of 12 tests which measure nine aptitudes: General Learning Ability; Verbal Aptitude; Numerical Aptitude; Spatial Aptitude; Form Perception; Clerical Perception; Motor Coordination; Finger Dexterity; and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, and a standard deviation of 20. Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, when combined, predict job performance. Cutting scores are set only for those aptitudes which aid in predicting the performance of the job duties of the experimental sample. The GATB norms described are appropriate only for jobs with content similar to that shown in the job description presented in this report. A description of the validation sample is also included. (AG)

ED 026444

B-451
S-182

United States Employment Service Technical Report

March 1966

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY

Development of USES Aptitude Test Battery for

Order Filler

(any ind.) 922.887

TM 001 612

U.S. DEPARTMENT OF LABOR
W. Willard Wirtz, Secretary
MANPOWER ADMINISTRATION
BUREAU OF EMPLOYMENT SECURITY
Washington, D.C. 20210

Technical Report on Development of USES Aptitude Test Battery

For .....

Order Filler (any ind.) 922.887
(9-88.40)

B-451 or S-182

U. S. Employment Service
in Cooperation with
Colorado and Minnesota State Employment Services

March 1966

GATB Study #2319

DEVELOPMENT OF USES APTITUDE TEST BATTERY

For

Order Filler (any ind.) 922.887

B-451 or S-182

This report describes research undertaken for the purpose of developing General Aptitude Test Battery (GATB) norms for the occupation of Order Filler (any ind.) 922.887 (2nd. Edition DOT code 9-88.40). The following norms were established:

GATB Aptitudes	Minimum Acceptable GATB, B-1002 Scores
Q - Clerical Perception	95
K - Motor Coordination	80
F - Finger Dexterity	85

RESEARCH SUMMARY - VALIDATION SAMPLE

Sample:

51 female workers employed as Order Fillers in Minnesota.

Criterion:

Supervisory ratings

Design:

Concurrent (test and criterion data were collected at approximately the same time).

Minimum aptitude requirements were determined on the basis of a job analysis and statistical analyses of aptitude mean scores, standard deviations, and selective efficiencies.

Concurrent Validity:

Phi Coefficient = .41 ($P/2 < .005$)

Effectiveness of Norms:

Only 69% of the non-test-selected workers used for this study were good workers; if the workers had been test-selected with the above norms, 84% would have been good workers. 31% of the non-test-selected workers used for this study were poor workers; if the workers had been test selected with the above norms, only 16% would have been poor workers. The effectiveness of the norms is shown graphically in Table 1:

TABLE 1

Effectiveness of Norms

	Without Tests	With Tests
Good Workers	69%	84%
Poor Workers	31%	16%

VALIDATION SAMPLE DESCRIPTION

Size: N = 51

Occupational Status: Employed workers

Work Setting: Workers were employed by **Greetings Unlimited in St. Paul,** Minnesota.

Employer Selection Requirements:

Education: No requirement

Previous Experience: No requirement

Tests: **None used**

Other: Applicant must be at least 5'3" tall.

Principal Activities: The job duties for each worker are those shown in the Appendix for the validation sample.

Minimum Experience: All workers had at least one month of job experience.

TABLE 2

Means, Standard Deviations (SD), Ranges, and Pearson Product-Moment Correlations with the Criterion (r) for Age, Education, and Experience

	Mean	SD	Range	r
Age (years)	27.7	9.2	18-49	.054
Education (years)	10.9	1.3	8-13	-.063
Experience (months)	8.8	12.9	1-72	.349*

* Significant at the .05 level

EXPERIMENTAL TEST BATTERY

All 12 tests of the GATB, B-1002A were administered to the validation sample during the period October 1958 to January 1960.

CRITERION

The criterion data consisted of supervisory rank order ratings of job proficiency made by the plant production superintendent at approximately the same time as the tests were administered with a time interval of about two weeks between the first and second rank order ratings. The rankings were converted to broad category scores.

Reliability: A reliability coefficient of .912 was obtained between the two ratings. Therefore, the ratings were added together and converted to broad category scores of 39,50 and 61.

Criterion Dichotomy: The criterion distribution was dichotomized into low and high groups by placing 31% of the sample in the low group to correspond with the percentage of workers considered unsatisfactory or marginal. Workers in the high criterion group were designated as "good workers" and those in the low group as "poor workers." The criterion critical score was 39.

APTITUDES CONSIDERED FOR INCLUSION IN THE NORMS

Aptitudes were selected for tryout in the norms on the basis of a qualitative analysis of job duties involved and a statistical analysis of test and criterion data. Tables 3, 4, and 5 show the results of the qualitative and statistical analyses.

TABLE 3

Qualitative Analysis
(Based on the job analysis, the aptitudes indicated appear to be important to the work performed.)

Aptitude	Rationale
Q - Clerical Perception	Necessary for speed and accuracy in reading order and selecting proper merchandise from correspondingly numbered bins and shelves.
F - Finger Dexterity	Necessary for picking up and stacking small items of merchandise such as toys, games, and greeting cards, filling cartons and attaching labels to carton lids with paper clips.
M - Manual Dexterity	Necessary for packing and handling merchandise and cartons.

TABLE 4

Means, Standard Deviations (SD), Ranges, and Pearson Product-Moment Correlations with the Criterion (r) for the Aptitudes of the GATB; N = 51

Aptitude	Mean	SD	Range	r
G - General Learning Ability	93.0	10.9	72-114	.157
V - Verbal Aptitude	95.4	11.7	74-123	-.083
N - Numerical Aptitude	90.7	12.8	59-127	.154
S - Spatial Aptitude	95.8	15.7	61-127	.183
P - Form Perception	100.8	16.4	57-139	.246
Q - Clerical Perception	103.9	11.5	74-128	.053
K - Motor Coordination	102.6	10.0	62-144	.300*
F - Finger Dexterity	101.9	21.3	52-141	.281*
M - Manual Dexterity	95.8	19.6	34-130	.443**

*Significant at the .05 level
**Significant at the .01 level

TABLE 5

Summary of Qualitative and Quantitative Data

Type of Evidence	Aptitudes								
	G	V	N	S	P	Q	K	F	M
Job Analysis Data									
Important						X		X	X
Irrelevant		X							
Relatively High Mean						X	X	X	
Relatively Low Standard Dev.	X	X	X			X			
Significant Correlation with Criterion							X	X	X
Aptitudes to be Considered for Trial Norms						Q	K	F	M

DERIVATION AND VALIDITY OF NORMS

Final norms were derived on the basis of a comparison of the degree to which trial norms consisting of various combinations of aptitudes Q, K, F and M at trial cutting scores were able to differentiate between the 69% of the sample considered good workers and the 31% of the sample considered poor workers. Trial cutting scores at five point intervals approximately one standard deviation below the mean are tried because this will eliminate about 1/3 of the sample with three-aptitude norms. For two-aptitude trial norms, minimum cutting scores of slightly more than one standard deviation below the mean will eliminate about 1/3 of the sample; for four-aptitude trial norms, cutting scores of slightly less than one standard deviation below the mean will eliminate about 1/3 of the sample. The Phi Coefficient was used as a basis for comparing trial norms. Norms of Q-95, K-80, and F-85 provided the highest degree of differentiation for the occupation of Order Filler (any ind.) 922.887. The validity of these norms is shown in Table 6.

TABLE 6

Concurrent Validity of Test Norms
Q-95, K-80, F-85

	Nonqualifying Test Scores	Qualifying Test Scores	Total
Good Workers	9	26	35
Poor Workers	11	5	16
Total	20	31	51

Phi Coefficient (Ø) = .41 Chi Square (X^2) = 8.52
Significance Level = P/2 $<$ .005

DETERMINATION OF OCCUPATIONAL APTITUDE PATTERN

The data for this study did not meet the requirements for incorporating the occupation studied into any of the 36 OAP's included in Section II of the Manual for the General Aptitude Test Battery. The data for this sample will be considered for future groupings of occupations in the development of new occupational aptitude patterns.

S-182 GATB Study #2364

Order Filler (any ind.) 922.887

Check Study #1 Research Summary

Sample:
55 workers (14 female and 41 male) employed as Order Fillers in Colorado.

TABLE 7

Means, Standard Deviations (SD), Ranges, and Pearson Product-Moment Correlations with the Criterion (r) for Age, Education, and Experience-Cross-Validation Sample #1.

	Mean	SD	Range	r
Age (years)	29.7	11.9	18-58	-.252
Education (years)	11.0	1.6	6-14	.187
Experience (months)	58.3	59.2	2-220	-.200

Criterion:
Supervisory ratings

Design:
Concurrent (test and criterion data were collected at approximately the same time).

Principal Activities:
The job duties for each worker are those shown in the Appendix for the cross-validation sample and are comparable to the duties of the validation sample.

Concurrent Validity:
Phi Coefficient = .48 ($P/2 < .0005$)

Effectiveness of Norms:
Only 67% of the non-test-selected workers in this sample were good workers; if the workers had been test-selected with the S-182 norms, 91% would have been good workers. 33% of the non-test-selected workers in this sample were poor workers; if the workers had been test-selected with the S-182 norms, only 9% would have been poor workers. The effectiveness of the norms when applied to this independent sample is shown graphically in Table 8:

TABLE 8

Effectiveness of S-182 Norms on Check Study Sample #1

	Without Test	With Tests
Good Workers	67%	91%
Poor Workers	33%	9%

A-P-P-E-N-D-I-X

S-182 March 1966

FACT SHEET

Job Title: **Order Filler 922.887 (9-88.40)**

Job Summary (Validation Sample): Fills customer mail orders for merchandise such as greeting cards, toys, games, household articles and earthenware according to numbers.

Work Performed (Validation Sample): Picks up assembled cardboard carton containing customer order form, pre-typed shipping label and "fragile" **or** other special type labels from overhead conveyor; sets opened carton on working table and fastens labels to carton flap with paper clip.

Reads customers order to determine type of merchandise ordered (order blanks and numbered from 1 to 681) and quantity of order. Selects cased, boxed or individual items of merchandise from bins or shelves correspondingly numbered from 1 to 681. (Order fillers are divided into two sections; the first section fills orders for items numbered from 1 to 355; the second section for orders numbered from 356 to 681); stacks merchandise on arm or deposits merchandise in carton; initials order slip when order is filled and sets carton on conveyor adjacent to packers.

May fill and pack "truck shipments" (100 or more items of the same type of merchandise) using cardboard cartons placed on buggies or dollies.

Must be able to fill from 75 to 100 orders in one half day at present time or during busy season.

Job Summary (Cross-Validation Sample): Under general supervision, pulls items of merchandise from shelves to fill customer orders for a wholesale drug firm, using a bin system of operation. Checks quantity of stock on shelves and replenishes stock when necessary.

Work Performed (Cross-Validation Sample): Checks each City and/or Country Order tote box moving along conveyor, or checks orders in box at beginning of conveyor to determine which orders are to be filled. Places pickers' clip on side of tote box he is to work on to indicate who is filling the particular order. Removes order and shipping labels from box, places order on clipboard, and fastens label to one side of tote box with a clothespin. Checks name and address on all papers contained with each respective order to see that they agree. Reads line entries completely and carefully, starting at the top of the order and working down the page. Selects proper number of each respective item from shelf and places items in carrying apron. Uses extreme care to assure that items removed from the shelf are correct in quantity, size, dosage, type, etc.; as requested on the order. Removes from the left of the merchandise the IBM Card closest to the merchandise taken from the shelf to fill the order. Selects proper card, or combination of cards, in units of 1, 3, 6, 12, or full case to represent, with as few cards as possible, the number of each respective item taken from shelf to fill the order. Places cards in cardholder attached to clipboard. Empties carrying apron into tote box when necessary, and transfers cards from clipboard to cardholder fastened to inside of tote box. Continues picking merchandise from shelves until order is completely filled. Places additional tote boxes as required in front of the original one, and attaches new labels to each new tote box added. Sends completed orders along conveyor to checking station.

Follows special instructions for handling certain situations such as back orders, items not stocked, discontinued items, etc. Exercises extreme care in the filling of narcotic orders to insure that the exact amounts and dosage of items are picked and that all items dispensed are recorded on the firm's narcotics' registers.

Separates orders according to City Orders and Country Orders. Arranges City Orders by delivery load according to time of day that deliveries are scheduled according to geographical area. Arranges Country Orders by method of shipment and time of pickup corresponding with shipping or mailing schedule of the particular method of shipment. Checks customer's names, address, register number, delivery method and time on all pages of order and all shipping labels. Checks number at top of each order to determine whether order is to be filled on right or left-hand side of warehouse.

Places order in box at the start of roller conveyor, or if designated for a particular time for pickup, places order in named tote box and affixes a clamp showing "call" or time on side of box facing stock shelves. Places box on conveyor on proper side according to section from which merchandise is to be picked.

Checks shelves in own section, periodically, for items needing to be restocked. Determines how many cases of each respective item are needed to replenish shelf stock. Takes merchandise from bulk stock and places on two-wheeled hand truck. Rolls hand truck to proper location for each respective item and places on floor as close as possible to where it is to be shelved. Opens cases of merchandise and places items on designated areas of shelves.

(This sheet is printed in duplicate. One copy should remain as part of the Appendix in order to complete the technical report. The other copy can be removed by employment service personnel who wish to set up separate fact sheet files.)

A-P-P-E-N-D-I-X

S-182 March 1966

FACT SHEET

Job Title: **Order Filler 922.887 (9-88.40)**

Job Summary (Validation Sample): Fills customer mail orders for merchandise such as greeting cards, toys, games, household articles and earthenware according to numbers.

Work Performed (Validation Sample): Picks up assembled cardboard carton containing customer order form, pre-typed shipping label and "fragile" or other special type labels from overhead conveyor; sets opened carton on working table and fastens labels to carton flap with paper clip.

Reads customers order to determine type of merchandise ordered (order blanks and numbered from 1 to 681) and quantity of order. Selects cased, boxed or individual items of merchandise from bins or shelves correspondingly numbered from 1 to 681. (Order fillers are divided into two sections; the first section fills orders for items numbered from 1 to 355; the second section for orders numbered from 356 to 681); stacks merchandise on arm or deposits merchandise in carton; initials order slip when order is filled and sets carton on conveyor adjacent to packers.

May fill and pack "truck shipments" (100 or more items of the same type of merchandise) using cardboard cartons placed on buggies or dollies.

Must be able to fill from 75 to 100 orders in one half day at present time or during busy season.

Job Summary (Cross-Validation Sample): Under general supervision, pulls items of merchandise from shelves to fill customer orders for a wholesale drug firm, using a bin system of operation. Checks quantity of stock on shelves and replenishes stock when necessary.

Work Performed (Cross-Validation Sample): Checks each City and/or Country Order tote box moving along conveyor, or checks orders in box at beginning of conveyor to determine which orders are to be filled. Places pickers' clip on side of tote box he is to work on to indicate who is filling the particular order. Removes order and shipping labels from box, places order on clipboard, and fastens label to one side of tote box with a clothespin. Checks name and address on all papers contained with each respective order to see that they agree. Reads line entries completely and carefully, starting at the top of the order and working down the page. Selects proper number of each respective item from shelf and places items in carrying apron. Uses extreme care to assure that items removed from the shelf are correct in quantity, size, dosage, type, etc.; as requested on the order. Removes from the left of the merchandise the IBM Card closest to the merchandise taken from the shelf to fill the order. Selects proper card, or combination of cards, in units of 1, 3, 6, 12, or full case to represent, with as few cards as possible, the number of each respective item taken from shelf to fill the order. Places cards in cardholder attached to clipboard. Empties carrying apron into tote box when necessary, and transfers cards from clipboard to cardholder fastened to inside of tote box. Continues picking merchandise from shelves until order is completely filled. Places additional tote boxes as required in front of the original one, and attaches new labels to each new tote box added. Sends completed orders along conveyor to checking station.

Follows special instructions for handling certain situations such as back orders, items not stocked, discontinued items, etc. Exercises extreme care in the filling of narcotic orders to insure that the exact amounts and dosage of items are picked and that all items dispensed are recorded on the firm's narcotics' registers.

Separates orders according to City Orders and Country Orders. Arranges City Orders by delivery load according to time of day that deliveries are scheduled according to geographical area. Arranges Country Orders by method of shipment and time of pickup corresponding with shipping or mailing schedule of the particular method of shipment. Checks customer's names, address, register number, delivery method and time on all pages of order and all shipping labels. Checks number at top of each order to determine whether order is to be filled on right or left-hand side of warehouse.

Places order in box at the start of roller conveyor, or if designated for a particular time for pickup, places order in named tote box and affixes a clamp showing "call" or time on side of box facing stock shelves. Places box on conveyor on proper side according to section from which merchandise is to be picked.

Checks shelves in own section, periodically, for items needing to be restocked. Determines how many cases of each respective item are needed to replenish shelf stock. Takes merchandise from bulk stock and places on two-wheeled hand truck. Rolls hand truck to proper location for each respective item and places on floor as close as possible to where it is to be shelved. Opens cases of merchandise and places items on designated areas of shelves.

(This sheet is printed in duplicate. One copy should remain as part of the Appendix in order to complete the technical report. The other copy can be removed by employment service personnel who wish to set up separate fact sheet files.)